THE Water Research FOUNDATION

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REQUEST FOR PROPOSALS (RFP)

Evaluating Innovative and Sustainable Treatment Options for Biosolids (RFP 5169)

Due Date: Proposals must be received by **3:00 pm Mountain Time on Tuesday, December 13, 2022**
WRF Project Contact: Ashwin Dhanasekar, adhanasekar@waterrf.org

Project Sponsors
This project is funded by The Water Research Foundation (WRF) as part of WRF's Research Priority Program.

Project Objectives

- Identify and evaluate innovative and sustainable biosolids processing technologies (e.g., thermal, chemical, biological) including but not limited to technologies that can provide the destruction of per- and poly-fluoroalkyl substances (PFAS) in biosolids. Technologies that can be integrated with circular economy approaches that yield beneficial co-products (syngas, biochar, etc.) are of particular interest, but not required.
- Tabulate information such as maturity/technology readiness level, life cycle cost, greenhouse gas emissions, and other relevant characteristics detailed below, to support utilities in assessing the application or adoption of these technologies.

Budget
Applicants may request up to $175,000 in WRF funds for this project.

Background and Project Rationale
The disposition landscape for biosolids has been relatively stable in recent years, with more than half of biosolids land applied and the rest largely either incinerated or landfilled. However, outside pressures and issues (e.g., PFAS, emerging constituents of concern, regulations) may reduce the availability of these existing options, prompting a need for innovative treatment, disposal, and beneficial use alternatives for biosolids. Today, utilities are increasingly seeking options outside the norm to treat their biosolids, especially technologies that can reduce costs, provide high-quality treatment, and potentially generate value.

This project provides an opportunity to evaluate these innovative and sustainable biosolids processing technologies with the main goal of helping utilities assess the implementation of these technologies and accelerate their adoption. Many treatment technologies are already known, but comparing them and

finding the right option for each utility is critical. A successful project will assist utilities in incorporating biosolids into their circular water economy and move the biosolids sector forward by adding value to water resource recovery facilities (WRRFs) and showcasing their importance.

Research Approach

A successful project will evaluate the landscape of innovative and sustainable technologies available for the treatment of any type of biosolids. This RFP is intentionally flexible in the research approach to encourage creativity and originality from proposers. Proposers should describe how they will conduct the research to meet the objectives listed above. The following approach is intended as a starting point.

An ideal proposal would include a summary of innovative technologies that expand options for biosolids management, including but not limited to processes that destroy PFAS and/or yield beneficial co-products (syngas, biochar, etc.). The survey will review technologies from the cutting-edge laboratory scale to full-scale operational systems at WRRFs, with a focus on those that are at or near full-scale implementation and have data available to provide a solid basis for evaluation. The information provided is expected to allow utilities to assess the applicability of each technology to their facilities, as well as the potential markets for the biosolids/products. The project may also include one or more deeper dives into the most promising technologies, such as a full case study with a path forward for technology adoption.

Ideally, the research proposed will help move forward one or many innovative technologies that address biosolids. Providing overarching research would be more valuable than investigating one specific part of a specific technology (e.g., whether pyrolysis works better at 300°F or 400°F would be less impactful than identifying the market conditions that need to change to make pyrolysis a viable technology)

Expected Deliverables

A white paper that identifies and characterizes innovative thermal, chemical, and biological technologies with a proven ability to sustainably process biosolids. More specifically, the white paper is encouraged to include the following:

- A description of each technology, including the contaminants removed (e.g., the specific PFAS compounds, the sizes and types of microplastics), the mechanism of destruction, and the removal efficiencies
- The maturity of each technology/technology readiness level (e.g., laboratory, pilot, full-scale, years in operation)
- Capital and O&M costs, including return on investment (ROI)
- Life cycle analysis (LCA) including greenhouse gas emissions
- End product marketability
- Potential negative impacts or unintended consequences of the technology
- Use cases at active WRRFs
- A comparison of successful (i.e., implemented or adopted by utilities) technologies (e.g., a comparison table)
- Areas for additional research or technology development

Another suggested deliverable is a decision support tool that can be used by utilities.

Communication Plan
Please review WRF's *Project Deliverable Guidelines* for information on preparing a communication plan. The guidelines are available at https://www.waterrf.org/project-report-guidelines. Conference presentations, webcasts, peer review publication submissions, and other forms of project information dissemination are typically encouraged.

Project Duration
The anticipated period of performance for this project is 12 months from the contract start date.

References and Resources
The following compilation of multiple PFAS scientific articles and/or studies by the Environmental Research and Education Foundation may be helpful to proposers. It is not intended to be comprehensive, nor is it required for consideration:

https://www.erefdn.org/per-and-polyfluoroalkyl-substances-pfas-list-of-scientific-and-technical-studies-related-to-solid-waste/

Proposal Evaluation Criteria
The following criteria will be used to evaluate proposals:

- Understanding the Problem and Responsiveness to RFP (maximum 20 points)
- Technical and Scientific Merit (maximum 30 points)
- Qualifications, Capabilities, and Management (maximum 15 points)
- Communication Plan, Deliverables, and Applicability (maximum 20 points)
- Budget and Schedule (maximum 15 points)

Proposal Preparation Instructions
Proposals submitted in response to this RFP must be prepared in accordance with the WRF document *Guidelines for Research Priority Program Proposals*. The current version of these guidelines is available at https://www.waterrf.org/proposal-guidelines, along with *Instructions for Budget Preparation*. The guidelines contain instructions for the technical aspects, financial statements, indirect costs, and administrative requirements that the applicant must follow when preparing a proposal.

Proposals that include the production of web- or software-based tools, such as websites, Excel spreadsheets, Access databases, etc., must follow the criteria outlined for web tools presented in the *Web Tool Criteria and Feasibility Study for The Water Research Foundation Project Deliverables* at https://www.waterrf.org/project-report-guidelines#deliverables.

Eligibility to Submit Proposals
Proposals will be accepted from domestic or international entities, including educational institutions, research organizations, governmental agencies, and consultants or other for-profit entities.

WRF's Board of Directors has established a Timeliness Policy that addresses researcher adherence to the project schedule. The policy can be reviewed at https://www.waterrf.org/policies. Researchers who are

late on any ongoing WRF-sponsored studies without approved no-cost extensions are not eligible to be named participants in any proposals. Direct any questions about eligibility to the WRF project contact listed at the top of this RFP.

Administrative, Cost, and Audit Standards
WRF's research program standards for administrative, cost, and audit compliance are based upon, and comply with, Office of Management and Budget (OMB) Uniform Grants Guidance (UGG), 2 CFR Part 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, and 48 CFR 31.2 Contracts with Commercial Organizations. These standards are referenced in WRF's *Guidelines for Research Priority Program Proposals* and include specific guidelines outlining the requirements for indirect cost negotiation agreements, financial statements, and the Statement of Direct Labor, Fringe Benefits, and General Overhead. Inclusion of indirect costs must be substantiated by a negotiated agreement or appropriate Statement of Direct Labor, Fringe Benefits, and General Overhead. Well in advance of preparing the proposal, your research and financial staff should review the detailed instructions included in WRF's *Guidelines for Research Priority Program Proposals* and consult the *Instructions for Budget Preparation*, both available at https://www.waterrf.org/proposal-guidelines.

Budget and Funding Information
The maximum funding available from WRF for this project is $175,000. The applicant must contribute additional resources equivalent to at least 33 percent of the project award. For example, if an applicant requests $100,000 from WRF, an additional $33,000 or more must be contributed by the applicant. Acceptable forms of applicant contribution include cost-share, applicant in-kind, or third-party in-kind that comply with 2 CFR Part 200.306 cost sharing or matching. The applicant may elect to contribute more than 33 percent to the project, but the maximum WRF funding available remains fixed at $175,000. **Proposals that do not meet the minimum 33 percent of the project award will not be accepted.** Consult the *Instructions for Budget Preparation* available at https://www.waterrf.org/proposal-guidelines for more information and definitions of terms.

Period of Performance
It is WRF's policy to negotiate a reasonable schedule for each research project. Once this schedule is established, WRF and its sub-recipients have a contractual obligation to adhere to the agreed-upon schedule. Under WRF's No-Cost Extension Policy, a project schedule cannot be extended more than nine months beyond the original contracted schedule, regardless of the number of extensions granted. The policy can be reviewed at https://www.waterrf.org/policies.

Utility and Organization Participation
WRF encourages participation from water utilities and other organizations in WRF research. Participation can occur in a variety of ways, including direct participation, in-kind contributions, or in-kind services. To facilitate their participation, WRF has provided contact information, on the last page of this RFP, of utilities and other organizations that have indicated an interest in this research. Proposers are responsible for negotiating utility and organization participation in their particular proposals. The listed utilities and organizations are under no obligation to participate, and the proposer is not obligated to include them in their particular proposal.

Application Procedure and Deadline
Proposals are accepted exclusively online in PDF format, and they must be fully submitted before 3:00 pm Mountain Time on December 13, 2022.

The online proposal system allows submission of your documents until the date and time stated in this RFP. To avoid the risk of the system closing before you press the submit button, do not wait until the last minute to complete your submission. Submit your proposal at: https://forms.waterrf.org/222555919460865.

Questions to clarify the intent of this RFP and WRF's administrative, cost, and financial requirements may be addressed to the WRF project contact, Ashwin Dhanasekar at 303 734 3423 or adhanasekar@waterrf.org. Questions related to proposal submittal through the online system may be addressed to Caroline Bruck at (303) 347-6118 or cbruck@waterrf.org**.**

5169 Utility and Organization Participants

The following utilities have indicated an interest in possible participation in this research. This information is updated within 24 business hours after a utility or an interested organization submits a volunteer form, and this RFP will be re-posted with the new information. **(Depending upon your settings, you may need to click refresh on your browser to load the latest file.)**

Stephen Estes-Smargiassi
Director of Planning and Sustainability
Massachusetts Water Resources Authority
100 First Ave.
Boston, MA 02129
USA
(617) 839-9638
smargias@mwra.com

Allison Deines
Dir. of Research and Strategy Engagement
Alexandria Renew Enterprises
1800 Limerick Street
Alexandria, VA 22314-3417
USA
(703) 721-3500
allison.deines@alexrenew.com

Dr. Albert Cox
Environmental Monitoring & Research Manager
MWRD Chicago
6001 W. Pershing Road
Cicero, IL 60804
USA
(708) 588-4068
coxa@mwrd.org

Graeme Hystad
Operation Supervisor
Metro Vancouver
4730 Kingsway
Burnaby BC V5H 0C6
Canada
(604) 786-0127
Graeme.Hystad@metrovancouver.org

Dr. Bina Nayek
Water Research Project Manager
Pinellas County Utilities
6730 142nd Ave N
Largo, FL 33771
USA
(727) 582-2306
bnayak@pinellascounty.org

Rebecca Long
Senior Public Affairs Specialist
Orange County Sanitation District
10844 Ellis Avenue
Fountain Valley, CA 92708
USA
(714) 593-7444
rlong@ocsan.gov

Dr. Benjamin Yoakum
Research and Innovation Project Manager
Orange County Utilities
9150 Curry Ford Road
Orlando, FL 32835
USA
(689) 258-2361
benjamin.yoakum@ocfl.net

Jackie Zipkin
General Manager
East Bay Dischargers Authority (EBDA)
2651 Grant Ave
San Lorenzo, CA 94580
USA
(510) 278-5910
jzipkin@ebda.org

5169 Utility and Organization Participants (continued)

John Norton
Director of Energy, Research, and Innovation
GLWA
735 Randolph Street, Suite 1101
Detroit, MI 48226
USA
(313) 400-2553
john.norton@glwater.org